

WHAT IS CLAIMED IS:

- 1        1.     A system for reducing database queries in connection with message  
2     transmissions, comprising:
  - 3                a subscriber database for storing message routing information for a plurality  
4     of mobile device subscribers, the message routing information including subscriber  
5     information and addresses of network nodes to which the subscribers are currently  
6     registered;
  - 7                a sending network element configured to retrieve the message routing  
8     information from the subscriber database for at least one destination subscriber among the  
9     plurality of mobile device subscribers, wherein the sending network element is configured  
10    to transmit at least one message and the message routing information towards the  
11    destination subscriber; and
  - 12               a messaging center coupled to receive the message and the message routing  
13     information from the sending network element via a data network, and to facilitate  
14     transmission of the message to a mobile device of the destination subscriber using to the  
15     message routing information received from the sending network element.
- 1        2.     The system as in Claim 1, further comprising a cache to store the message  
2     routing information for use with transmission of at least one subsequent message towards  
3     the destination subscriber.
- 1        3.     The system as in Claim 2, wherein the sending network element is coupled  
2     to the cache and configured to query the cache to obtain the stored message routing  
3     information.
- 1        4.     The system as in Claim 3, wherein the network element is configured to  
2     transmit the message and the stored message routing information from the cache, if the  
3     cache contains the message routing information.

1           5.     The system as in Claim 3, wherein the cache is configured to retrieve the  
2 message routing information from the subscriber database if the cache does not contain the  
3 message routing information.

1           6.     The system as in Claim 2, wherein the messaging center is further  
2 configured to query the cache to request that the cache obtain the stored message routing  
3 information if the message routing information is not received by the messaging center, or  
4 if the subscriber information is unknown to the network node identified by the address  
5 provided via the message routing information.

1           7.     The system as in Claim 1, wherein the messaging center is configured to  
2 query the subscriber database to obtain the message routing information if the message  
3 routing information is not received by the messaging center or if the subscriber information  
4 is unknown to the network node identified by the address provided via the message routing  
5 information.

1           8.     The system as in Claim 1, further comprising a Mobile Switching  
2 Center/Visiting Location Register (MSC/VLR) to which the destination subscriber is  
3 currently registered, and wherein the address of the network node to which the destination  
4 subscriber is currently registered comprises at least the address of the MSC/VLR to which  
5 the destination subscriber is currently registered.

1           9.     The system as in Claim 8, wherein the subscriber information comprises a  
2 unique subscriber identifier identifying the destination subscriber, and wherein the  
3 messaging center is configured to transmit the message to the MSC/VLR for delivery to  
4 the destination subscriber identified by the unique subscriber identifier.

1           10.    The system as in Claim 8, further comprising a Serving GPRS Support  
2 Node (SGSN) to which the destination subscriber is currently registered, and wherein the  
3 address of the network node to which the destination subscriber is currently registered

4 further comprises the address of the SGSN to which the destination subscriber is currently  
5 registered.

1 11. The system as in Claim 10, wherein the subscriber information comprises a  
2 unique subscriber identifier identifying the destination subscriber, and wherein the  
3 messaging center is configured to transmit the message to the SGSN for delivery to the  
4 destination subscriber identified by the unique subscriber identifier.

1 12. The system as in Claim 1, further comprising a Serving GPRS Support  
2 Node (SGSN) to which the destination subscriber is currently registered, and wherein the  
3 address of the network node to which the destination subscriber is currently registered  
4 comprises at least the address of the SGSN to which the destination subscriber is currently  
5 registered.

1 13. The system as in Claim 1, wherein the subscriber information comprises an  
2 International Mobile Subscriber Identity (IMSI).

1 14. The system as in Claim 1, wherein the network element is configured to  
2 retrieve the message routing information from the subscriber database using a contact  
3 address of the mobile device of the destination subscriber as an index to the subscriber  
4 database.

1 15. The system as in Claim 14, wherein the contact address comprises a Mobile  
2 Subscriber ISDN Number (MSISDN) of the mobile device of the destination subscriber.

1 16. The system as in Claim 1, wherein the subscriber database comprises a  
2 Home Location Register (HLR) in which the destination subscriber is registered.

1 17. The system as in Claim 1, wherein the network element comprises any of a  
2 WAP gateway, presence server, terminal management server, messaging gateway,  
3 payment server, or a messaging center.

1           18.    The system as in Claim 1, further comprising a signaling network, wherein  
2    the network element is configured to query the subscriber database of the destination  
3    subscriber via the signaling network.

1           19.    The system as in Claim 18, wherein the signaling network comprises an  
2    SS7 network.

1           20.    The system as in Claim 1, wherein the sending network element comprises  
2    a sending Multimedia Messaging Service Center (MMSC) and the messaging center  
3    comprises a receiving MMSC, and wherein the message comprises a Multimedia  
4    Messaging Service (MMS) message.

1           21.    The system as in Claim 20, further comprising:  
2                a push proxy gateway coupled to the receiving MMSC to receive the  
3    subscriber information and the network node address provided by the sending MMSC; and  
4                a notification node operable to notify a mobile station associated with the  
5    destination subscriber that the MMS message is available, wherein the notification node is  
6    coupled to receive the subscriber information and the network node address for use in  
7    identifying the destination subscriber.

1           22.    The system as in Claim 21, wherein the receiving MMSC is configured to  
2    provide the subscriber information and the network node address to the push proxy  
3    gateway via a field of a Push Access Protocol (PAP).

1           23.    The system as in Claim 22, wherein the push proxy gateway is configured  
2    to provide the subscriber information and the network node address to the notification node  
3    via a Short Message Service (SMS) message.

1           24.    The system as in Claim 23, wherein the notification node comprises a Short  
2    Message Service Center (SMSC).

1           25. The system as in Claim 1, wherein the sending network element comprises  
2 a sending Multimedia Messaging Service Center (MMSC) and the messaging center  
3 comprises a receiving MMSC, and wherein the sending MMSC is configured to transmit  
4 the at least one message and the message routing information to the receiving MMSC via  
5 an MM4 interface.

1           26. A method for reducing queries associated with the transmission of messages  
2 over a network, comprising:

3                   initiating a query, from at least one network element involved in the  
4 transmission of messages, to a subscriber database associated with a destination subscriber;

5                   in response to the query, receiving message routing information for  
6 transmitting at least one message from the network element towards the destination  
7 subscriber;

8                   transmitting the message and the message routing information from the  
9 network element to a messaging center associated with the destination subscriber; and

10                   transmitting the message from the messaging center to a delivery node for  
11 ultimate delivery to the destination subscriber, wherein the message is transmitted from the  
12 messaging center to the delivery node identified by the message routing information  
13 received from the network element.

1           27. The method of Claim 26, further comprising querying the subscriber  
2 database by the messaging center to obtain the message routing information if the message  
3 routing information was not received with the message.

1           28. The method of Claim 26, further comprising querying the subscriber  
2 database by the messaging center to obtain the message routing information if delivery of  
3 the message to the delivery node fails.

1           29. The method of Claim 28, wherein querying the subscriber database by the  
2 messaging center comprises querying the subscriber database by the messaging center if

3 subscriber information provided via the message routing information is unknown to the  
4 delivery node identified by the message routing information.

1 30. The method of Claim 28, further comprising providing delivery status by  
2 the messaging center to the subscriber database if an address of the delivery node obtained  
3 from the subscriber database is the same as the address of the delivery node obtained from  
4 the message routing information provided by the at least one network element.

1 31. The method of Claim 26, further comprising storing the message routing  
2 information that was received in response to the query in a cache.

1 32. The method of Claim 31, further comprising initiating a query from the at  
2 least one network element to the cache to obtain the message routing information for  
3 transmission of a subsequent message to the messaging center.

1 33. The method of Claim 31, further comprising initiating a query from the  
2 messaging center to the cache to request that the cache obtain updated message routing  
3 information if the subscriber information is unknown to the delivery node identified by the  
4 message routing information.

1 34. The method of Claim 26, wherein the message routing information for the  
2 destination subscriber comprises a subscriber identifier and an address of the delivery node  
3 to which the destination subscriber is registered.

1 35. The method of Claim 34, wherein the subscriber identifier comprises an  
2 International Mobile Subscriber Identity number (IMSI), and wherein the address of the  
3 delivery node comprises an address for one or more of a Mobile Switching Center/Visiting  
4 Location Register (MSC/VLR) and a Serving GPRS Support Node (SGSN).

1 36. A network element for facilitating the transmission of messages over a  
2 network, comprising:

3                   a query module configured to formulate a query to a subscriber database  
4                   associated with a destination subscriber;  
5                   a network interface to transmit the query and to receive message routing  
6                   information in response thereto;  
7                   a message transmission module to associate the message with the message  
8                   routing information; and  
9                   wherein the network interface transmits the message and associated  
10                  message routing information to a messaging center serving the destination subscriber,  
11                  wherein the message routing information includes a subscriber identity of the destination  
12                  subscriber and an address of a delivery node for use by the messaging center in delivering  
13                  the message to the destination subscriber.

1                   37.    A computer-readable medium having instructions stored thereon which are  
2                   executable by a computer system for reducing queries associated with the transmission of  
3                   messages over a network by performing steps comprising:  
4                   initiating a query to a subscriber database associated with a destination  
5                   subscriber;  
6                   receiving message routing information for transmitting a message towards  
7                   the destination device; and  
8                   transmitting the message and the message routing information to a  
9                   messaging center associated with the destination subscriber to facilitate transmission of the  
10                  message from the messaging center to the destination subscriber using the message routing  
11                  information.